



Heat Pump Water Heater

HPW-60/80AT

HPW-60/80AE



User Guide

About A. O. Smith

In 1936, A. O. Smith developed and patented the process of glass-lined water heaters, pioneering the modern standard in water heater design. Over the past years, A. O. Smith has gained respect and support of homeowners, contractors, architects, and specifying engineers in over 60 countries by providing innovative, energy-saving products designed for years of trouble-free service.

A. O. Smith Water Products Company, now the largest water heater manufacturer in the world, continues the tradition of innovation and becomes a global leader in water product industry.

Contents

User Guide	1
Physical Characteristics	3
SafetyFeature	4
High Temperature Limit Protection Switch	4
Safety Valve	4
Tri - polar Power off Protection System	4
Product Features	4
Energy - saving Heating	4
Electronic Controller	4
Glass - lined Protection Tank	5
Anode Protection	5
High Efficiency Energy-saving Insulation	5
Installation Instructions	5
Mounting	5
Mounting Procedures and Precautions	6
Mounting Consolidation	7
Pipe Connection	8
Three-pass Discharge Pipe Connection	8
Condensate Water Pipe Connection	8
Power Connection	8
Water Filling	9
Remote Controller	9
Operation Instructions	10
Electronic Controller Operation	10
Electric Leakage Inspection	13
Safety Valve Inspection	13
Remote Controller	13
Maintenance Instruction	14
Maintenance	14
Troubleshooting	15
Wiring Diagram	16
Warning	17
Part List	17

User Guide

- Only professional installers acknowledged by A.O.SMITH are permitted to install the heat pump water heater. If the water heater is installed with self-prepared installation materials or by un-authorized personnel, A.O.SMITH will not be responsible for all losses incurred thereby, including but not limited to pipeline leakage, fall or improper installation that may affect normal operation and performance of water heater.
- The heat pump water heater is for residential application. Therefore, it may affect life expectation if it is used for commercial application.
- After installation and operation of the heat pump water heater, users should inspect the system regularly and make necessary maintenance according to operation conditions. If any abnormality occurs, please stop operation immediately, and contact local authorized dealer for repair to ensure the normal, safe, and reliable operation of the water heater.
- The anode rod is a consumable part and it is generally suggested to check and replace the anode rod every 2 or 3 years. Users could contact the local authorized dealer for check and replacement to extend life expectation of water heater.
- Prior to any maintenance or repair of the heat pump water heater, please cut off power supply. Unauthorized personnel are not permitted to adjust and repair the heater.
- In case of any component soaked by water, the water heater is not permitted to use until checked by authorized service staff.
- Main components of the heat pump water heater are protected by insulation material to ensure safety use. Any damaged power cords should be replaced by authorized service staff.
- The pressure relief valve, equipped on the heat pump water heater, is forbidden to change installation position or be blocked. Discharge pipe is required to connect the valve and down toward floor drain.
- In case of any fault in ground wire circuit, tri-polar power-off protection system will cut off all connection between water heater and electric supply circuit instantaneously. Please stop using, pull the plug, and contact local authorized dealer.
- Water, including hot water, out of the heat pump water heater is not permitted for drinking.
- Electricity for the heat pump water heater should be supplied by independent branch of circuit, of which electricity meter, breaker, maximum current need to be checked by professional electrician in advance.
- Power socket should be located at a dry place, and power cord should not be pushed or pulled with wet hand to avoid the danger of electric shock.

- Damaged electric wire, aged, loose and unfixed socket are not suggested to be used because of the danger of electric shock, short circuits, fires, etc. Please ensure power cord and socket could be connected well.

A. O. SMITH (China) water Heater Company Ltd reserves the rights to explain all provisions mentioned above.

Caution: Failure to follow instructions in the user guide may cause fire disaster, which would be a threat to life and property security.

Warning: Heat pump water heater is not permitted for use without reliable ground wire circuit for power socket. In case of indicator lighted up for “ground wire circuit fault”, please immediately stop using, pull plug and contact local authorized dealer. Well-drained floor drain is essential to prevent the damage to surroundings or downstairs in case of leakage of heater or joint.

Physical Characteristics

Fig. 1 Appearance Features

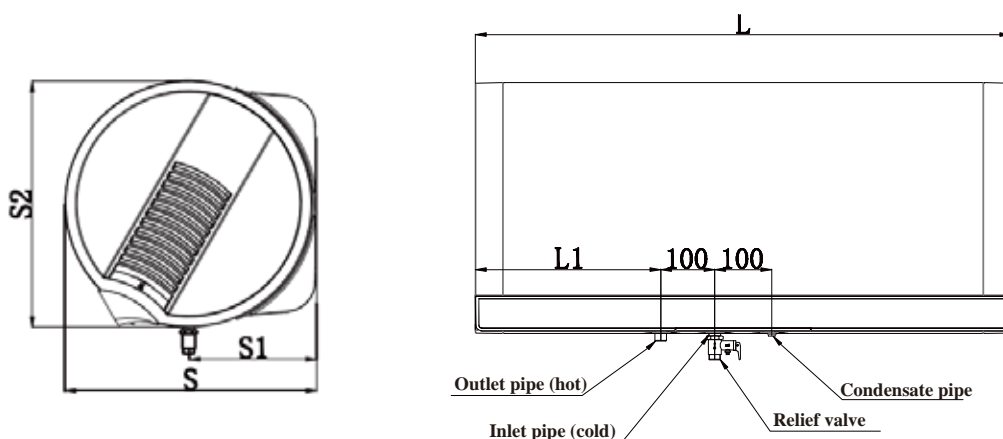


Table 1 Outline Dimensions

Model	L (mm)	S (mm)	S1 (mm)	S2 (mm)	L1 (mm)
HPW-60AT/AE	837	473	241	465	290
HPW-80AT/AE	992	473	241	465	344

Specifications

Table 2 Specifications

Model	Rated Capacity (L)	Rated Voltage(V) /Rated Frequency (Hz)	Rated Input Power (W) /Rated Electric Current (A)			Rated Heating Output(W)		
			Efficiency Mode	Hybrid Turbo Mode	MAX	Efficiency Mode	Hybrid Turbo Mode	MAX
HPW-60AT	60	220~/60	210/0.95	2210/10	3000/13.7	540	2540	3000
HPW-80AT	80	220~/60	210/0.95	2210/10	3000/13.7	540	2540	3000
HPW-60AE	60	220~/50	210/0.95	2210/10	3000/13.7	540	2540	3000
				1010/4.6	1200/5.5		1340	1340
HPW-80AE	80	220~/50	210/0.95	2210/10	3000/13.7	540	2540	3000
				1010/4.6	1200/5.5		1340	1340

Table 3 Specifications

Model	Rated Tank Pressure (Mpa)	Water Temp Range ()	Ambient Temp Range in Efficiency Mode ()	Water Temp Range in Efficiency Mode ()	Refrigerant	Refrigerant Charge Volume (g)	Noise Level (dB(A))	Net Weight (kg)
HPW-60AT/AE	0.8	35~75	10~44	10~55	R134a	123	≤40	42
HPW-80AT/AE	0.8	35~75	10~44	10~55	R134a	123	≤40	45

Safety Feature

High Temperature Limit Protection Switch

A high temperature limit protection thermal cutout is equipped on the heat pump water heater. The switch cuts off the phase and neutral line instantaneously and simultaneously to guarantee safety in case water temp reach the high temp limited due to water heater fault. If this happens, please contact local authorized dealer.

Safety Valve

A safety valve shown in fig.1 (Model G1/2-0.8, default 0.8MPa, not adjustable by user) is equipped on inlet tube of heat pump water heater. The valve will relieve pressure automatically when piping system pressure exceeds the setting point. Discharge pipe is required to connect the valve in a frost-less environment and down toward floor drain, and in any case should the pipes or the three-pass discharge pipes be blocked (For installation of safety valve, refer to Fig. 7).

Tri-polar Power-off Protection System

In case of any fault in ground wire circuit, tri-polar power-off protection system will cut off all connection between water heater and electric supply circuit instantaneously.

Product Features

Energy-saving Heating

A new generation water heater, heating residential water by air-source based on the Inverse Cano Principle.

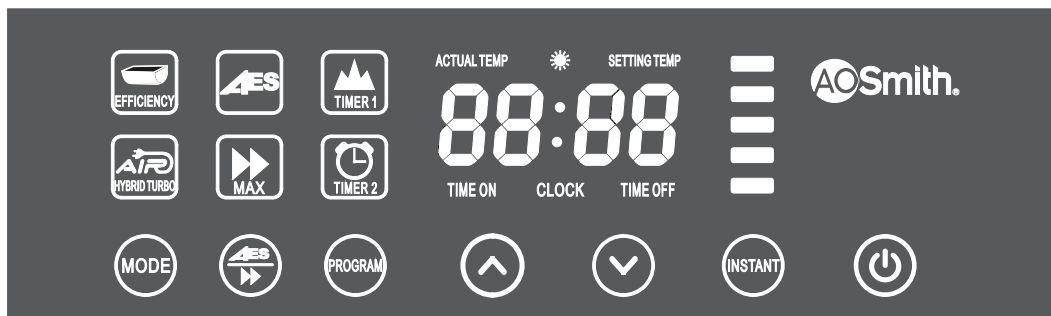


Fig. 2 Electronic Controller

Electronic Controller

Mode

User could select Efficiency mode or Hybrid Turbo mode. The factory default setting is Efficiency mode, an energy-saving mode, and Hybrid Turbo mode is both energy-saving and rapid heating.

AES (Adaptive Energy-saving System)

By recording and learning user's habit of water usage, patented AES feature adopts heating cycles automatically, which will facilitate water usage and save energy by minimizing thermal loss.

MAX

MAX function means more hot water output, therefore, better bath experience.

Program

Program is to set up clock, and timing for heating. Two timers is available.

Hot Water Amount Display

Five light blocks visibly indicate the hot water amount available in tank.

Power-off Memory

By power-on more than 4 hours, the water heater could keep setting information for 72 hours when power supply is cut-off.

Glass - lined Protection Tank

The Glass-lined protection tank is a patent by A.O.Smith, coating tank with Silicide smoothly and fusion at 870 °C. The anti-rust and anti-scaling glass coating has pass 100,000 cycles fatigue life test in accordance with relevant UL Standards.

Anode Protection

A powerful steel-core-anode rod is used to protect tank and greatly prolong service life of the heat pump water heater.

High Efficiency Energy-saving Insulation

A polyurethane foam insulating layer without Freon reduces heat loss effectively.

Caution: Hot water over 50 °C has the risk of causing scald. Please do take care of your family when setting temp over 50 °C.

Installation Instructions

Caution:

The initial power on should be over 30 minutes after installation.

2 or more staffs are needed to move or install the heat pump water heater due to the heavy weight.

Plastic components on both left and right side can not afford overexertion, please take good care. Neither tiling over 45° angle nor vertical placing is permitted. Disassembly and assembly by users or unauthorized personnel are prohibited.

Mounting

The heat pump water heater should be installed at a location that is close to power source, floor drain and water utilization point. The heater should not be installed in places filled with fumes, strong electromagnetic waves, high fluctuations of power voltage, acid or alkaline vapor. The air inlet of the heat pump system

should be available as water may be discharged through relief valve or discharge pipe during the operation of the system. The installation place should ensure no damage to surroundings or downstairs in case of leakage of heater or joint. Make sure to install inlet, outlet and discharge pipe under the heater.

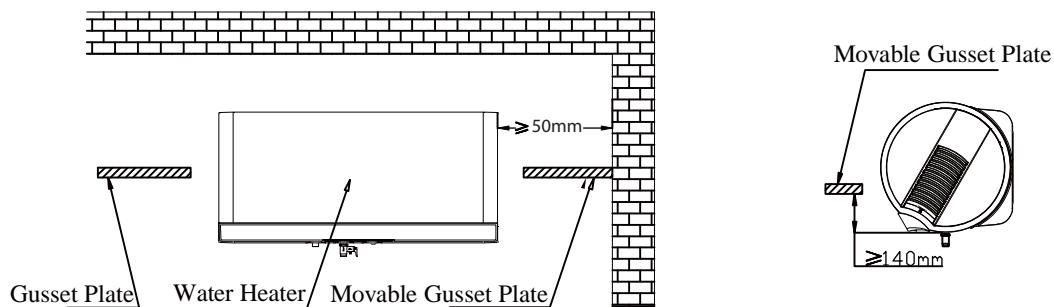
Vertical installation of the water heater is strictly prohibited.

Notice: Make sure to use original accessories to install the heater. Do not mount the heater until accessories are fixed on wall, or it may fall down and cause accident.
Independent branch of circuit with diameter of wire no less than 2.5mm is suggested, as max input power of the heater is 2.5kW.

Mounting Procedures and Precautions

- Ensure mounting wall can afford at least four times the weight of the heat pump water heater full of water. Corresponding protective measures such as bracket is essential when install on nonbearing wall.
- In order to easily open side cover for maintenance or resetting high temp limit switch and for fine air movement required by heat pump system, please ensure 300 mm (at least 50mm) or more distance between wall and right side of heater, between which there should also be no curtain, towel and anything that could be moved by blow. If the heater is embedded into a gusset plate, the plate on the right side should be moveable for easy repair and maintenance. Refer to Fig.3 for details.
- The heater should not be located outdoors or in a freezing environment. If freezing occurs, the tank and water pipe may break, therefore be in the risk of scalds or leakage.
- The heater could be installed in half-hidden style. Refer to Fig.3

Fig.3 Installation



- Using an inner hexangular spanner and expansion screw to fix hook on wall.
- Using an inner hexangular spanner and expansion screw to fix hook on wall.

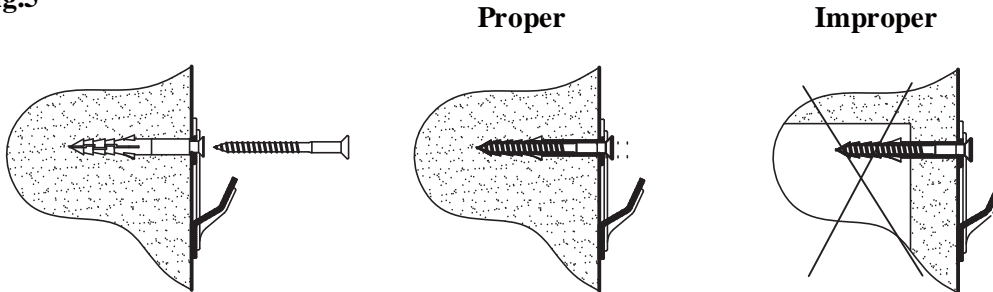
Fig.4 Distance between Appearance Features



Model	L(mm)
HPW-60AT/AE	260
HPW-80AT/AE	380

Notice: Before insert screw into punching, a nylon expansion tube wire should get through the hole of hook first.
 Use an inner hexangular spanner to screw in, and other tooling are suitable.
 Ensure the counter sunk head of the screw is not over-tightened Match up two sets of hooks and holes of hanging panels to the back of the heater, and then move the heater down to get fixed.

Fig.5

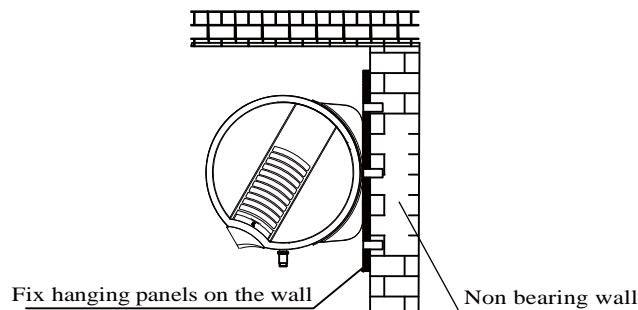


Notice: Original installation accessories should be used on solid wall. The heater may have has risk of fall in case of improper installation. Refer to Fig.5.

Mounting Consolidation

Consolidation is essential when install the heater on nonbearing wall. Refer to Fig.6.

Fig.6 Mounting Consolidation



Caution: When install leakage protection power cord, please refer to Fig.6 to prevent water flow along power cord to plug and socket.

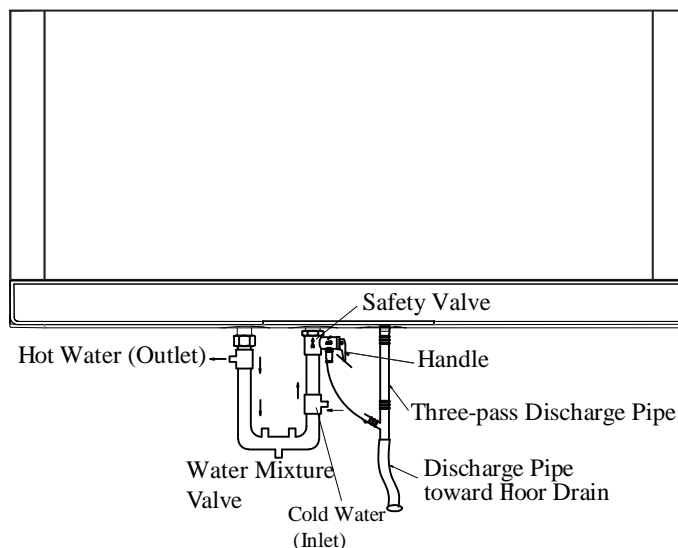
Pipe Connection

Connect a safety valve to the inlet tube (i.e. blue cap side) of heater, keeping arrow accord with water flow (i.e. toward the heater) (Refer to Fig.7 for more detail). Connect a discharge pipe with safety valve. Connect the hot water pipe to the outlet tube (i.e. red cap side).

For safety valve installation, please refer to chapter of “Safety Feature”. If water pressure of inlet pipe approaches or even exceeds relief point (0.8MPa) of the safety valve, please install a decompression valve on the water inlet pipe away from the heater.

Water pipe and heater are only permitted to be connected by PPR pipe.

Fig. 7 Pipe Connection



Notice: Thread sealing tape or seal ring is essential for pipe connection joint for leakage-proof purpose. Do not over-tighten the safety valve or it may get damaged.

Three-pass Discharge Pipe Connection

After mounting of the heater, use three-pass discharge pipe to connect safety valve and discharge-pipe as per Fig.7.

Condensate Water Pipe Connection

Ensure three-pass discharge pipe, connected with condensate water outlet, is unobstructed and toward floor drain.

Power Connection

Power cord and plug are equipped with the water, please ensure plug and socket are fitting.

Notice: Ensure that the heater and socket are both reliably grounded. Use an independent high-quality socket with rated max current no less than 16 A. Ensure reliable contact between plug and socket.

Water Filling

After all the pipes connection, open the outlet valve of the heater and then the inlet valve. Fill heater tank with water until water flowing smoothly through outlet pipe, which means the tank is full of water. Shut off the outlet valve, and check if there is any leakage at joints. If yes, evacuate the tank, fix joints and repeat until no leakage appears.

Remote Controller

User could fix remote controller on the wall near the heater with bracket if needed.

Remote Controller Bracket Installation

- Remote controller bracket should be located at a dry place.
- Using impact electric drill with $\Phi 6\text{mm}$ drill, make two horizontal punching, between which, the distance should be 28mm (Refers to Fig.8). Use expansion pipes and screws (in accessories) to fix bracket on the wall.
- Fit remote controller with battery into the bracket.

Remote Controller Battery Installation

- Use a coin to remove battery cover in back of controller in anticlockwise direction.
- Put CR2025 battery (in accessories) into controller, with "+" polar upwards.
- Use a coin to fix battery cover in clockwise direction.

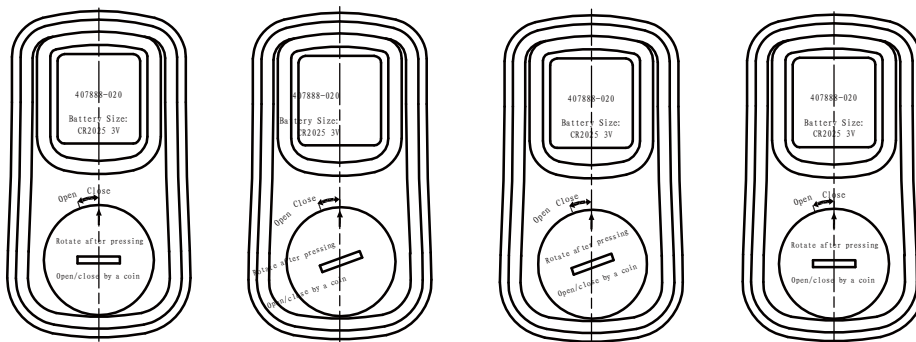


Fig.8

Operation Instructions

Notice: Before initial power on, ensure the tank full of water, plug and socket connected properly, and the heater laid for at least 30 min after installation.

Electronic Controller Operation

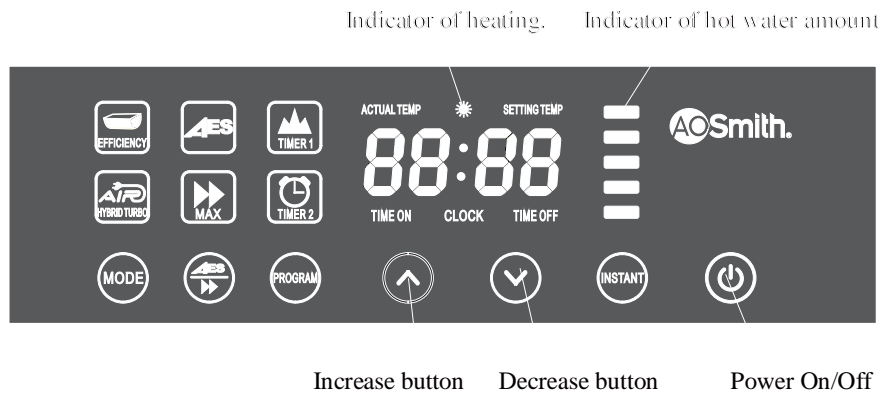


Fig.9

1. Initial Power On

For the first-ever power connection, electronic controller will run self-inspection program. All indicators on the screen will light up and last for a few minutes and then power-off.

Notice: When water heater is disconnected with power supply by plug-out or power cut, the temperature, timer-1, timer-2, AES and MAX will load status before the break. By power-on more than 4 hours, the heater could keep clock setting information for 72 hours when power supply is cut-off.

2. Power On / Off

Press Power ON/OFF button (⏻), the heater will be power-on. Setting temp and actual temp will be displayed a few seconds later.

When heater is power on, pressing Power ON/OFF button turn the heater into power-off status. (Refer to Fig.10.)

Default setting: Efficiency Mode (EFFICIENCY), MAX (MAX) on, Setting Temp at 70, Setting Clock at 12:00.

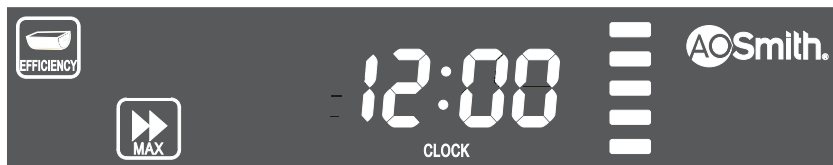









Fig.10

3. Clock Setting (Fig.11)

With heater power on, by one-touch on  button, clock will be displayed for 10 seconds. With timer-1 and timer-2 off, pressing and hold  button for a few seconds will enter clock setting status. With hour digit flashing, user could press  or  to set hour digit within the range form 0 to 23. With minute digit flashing, user could press  or  to set minute digit within the range form 0 to 59. User could change the status among hour digit, minute digit and exit by touching .

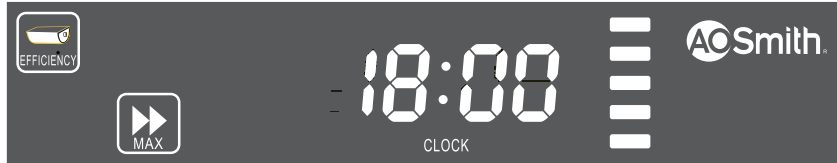




Fig.11

4. Temperature Setting (Fig.12, 13)

With heater power on, user could press  or  to set temperature within the range form 35 to 75.

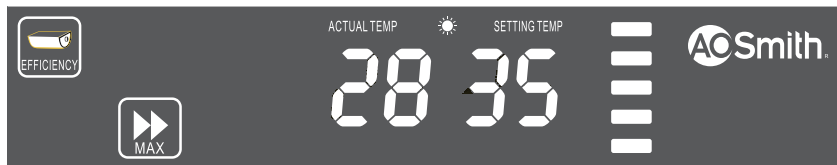


Fig.12

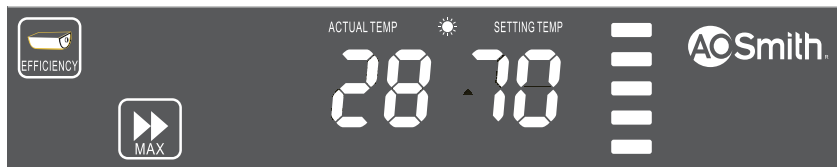










Fig.13

5. Timing

Prior to timing, clock should be set. With heater power on, user could change the status among “Clock display”, “Timer-1”, “Timer-2”, “Timer-1 and Timer-2” and off by touching .

● Timer-2 (Fig.14)

With Timer-1 indicator  light up, user could press and hold  button to enter Timer-2 setting status. With “TIME ON” and  flashing, user could press  or  to increase or decrease “TIME ON” by 30 minutes. With “TIME OFF” and  flashing, user could increase or decrease “TIME OFF” in the similar way. User could change the status among time-on, time off and exit by touching .

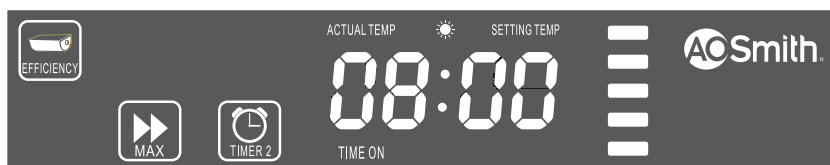




Fig.14

● **Timer-1 (Fig.15)**

With Timer-1 indicator  light up, user could press and hold  button to enter Timer-1 setting status, and set in the same way of Timer-1.

Notice:

- Default Timer-1: 21:00-08:00;
- Default Timer-2: 12:00-21:00;
- Available Period of Time On: 21:00-7:30;
- Available Period of Time Off: 30 minutes after Time On to 8:00;
- With indicator of both Timer-1 and Timer-2 light up, water heater will work in both periods;
- Neither Timer-1 nor Timer-2 could work simultaneously with AES, that means once Timer-1 or Timer-2 turns on, AES will turn off automatically.

Fig.15



6. Heating Mode

With heater power on, choose mode of Efficiency  or Hybrid Turbo  by touch Mode button (Fig.16 & 17) ;

In Efficiency mode, the heater is heating highly-efficiently;

In Hybrid Turbo mode, the heater is heating both efficiently and rapidly.

Notice:


- When choose Efficiency mode, heater will not work until 3 minutes after power on;
- If rapid heating is needed, please choose Hybrid Turbo mode or choose Instant mode by touch button  . (Refer to 9. Instant heating)

Fig.16

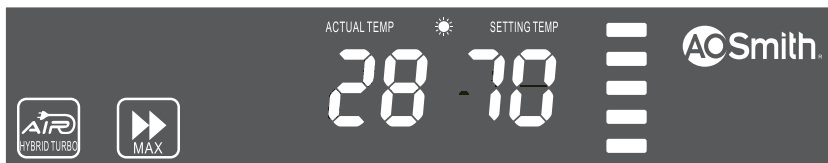
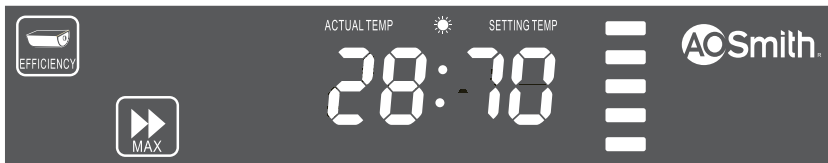


Fig.17





7. MAX&AES



User could change the status among "MAX", "AES", "MAX and AES" and off by touching  .

Notice:

AES could not work simultaneously with any Timer, which means once AES turns on, Timer will turn off automatically.

8. Instant Heating



When power on, users could touch  to turn on “Instant heating” with  flashes for three times. Once reach setting temp, the heater will automatically change back to the mode before “Instant heating”.

When “Instant heating” mode is on, users could touch  to turn off “Instant heating” with  flashes just for one time.

9. Indicator of hot water amount

Five blocks of light indicates the hot water amount available in tank. Based on your setting temp, red blocks mean more hot water available than orange ones, which in turn mean more hot water available than green ones.

10. Reset

Reset may help heater recover from misoperation or fault. Press and hold both  and  simultaneously for 8 seconds, will turn off the heater after 2 seconds display off all characters on screen, and reset setting temp, clock, timer to default status and remove AES memory.

Electric Leakage Inspection

In case of any unsafety detected, tri-polar power-off protection system will cut off power connection, with “reset” button popup and power indicator turned from green into orange. Please try to push reset button, if it does not work, contact local authorized dealer.

Notice:

User should check the tri-polar power-off protection system regularly as follow: With power indicator initially in green, press “Test” button to turn it off, and press “reset” button to turn it back to green. Otherwise, contact local authorized dealer.

Safety Valve Inspection

Safety valve is a kind of protection device against overpressure, thus it is a normal phenomenon to see water discharged from safety valve when water pressure rises over 0.8Mpa due to heating or supply reason.

NOTICE: User should check safety valve regularly as follow: open handle on safety valve to get rid of the calcium carbonate deposit and etc., if water dose not discharge from valve, please contact local authorized dealer.

Remote Controller (Fig. 18)

- The function and operation of button on remote controller are similar with the ones on electronic controller on the heater.
- Install battery before use remote controller. (Refer to Chapter Installation Instructions)
- Please change battery if indicator dose not flash when press any button. Using remote controller toward the receiver on water heater, and keep
- distance within 4 meters.



Fig. 18

Maintenance Instructions

Declaration: Only authorized service staff is permitted for maintenance service. Improper maintenance may have risk of serious injury or property damage.

Warning: Ensure heater is disconnected from power source before maintenance to avoid electric shock.

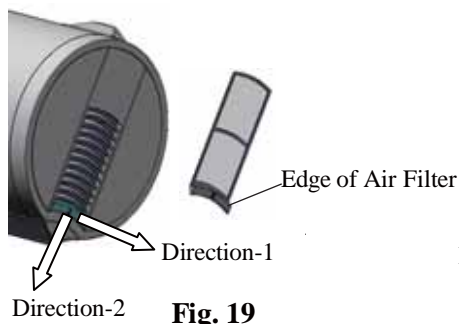
Notice: User may do some easy repair works referring to the trouble shooting chart, before contact local authorized dealer.

Maintenance

- Drain the tank if needed: Close water inlet valve, rotate the handle on safety valve, release the nut connected to joint of tank, and drain water through discharge pipe.
- Clean the tank regularly.
 - (1) Cut off power.
 - (2) Screw off safety valve and remove inlet tube on the heater.
 - (3) Connect water outlet pipe with tap water, fill water through this end. Connect water inlet pipe with floor drain, discharge water through this end.
 - (4) Open water inlet valve to get maximum tap water flow, flush the tank until clean water come out of tank.
 - (5) Connect water inlet and outlet pipes referring to Fig.7, and check if there is leakage.

Notice: Be cautious about the hot water discharged from the tank, as it may have risk to cause scald.

- Clean air filter semiannually to avoid block, which may affect heating efficiency.
 - (1) Disassembling air filter (refer to Fig. 19). Hold the wedging block on edge of air filter (nearby mark of "PUSH"), pull toward right side of heater (Direction-1) softly, and pull the whole filter downward (Direction-2) slowly.
 - (2) Wash air filter by water and dry.
 - (3) Assembling air filter (refer to Fig. 20). Insert air filter upward (Direction-3) to fulfill the cover gap and press filter to get fixed.

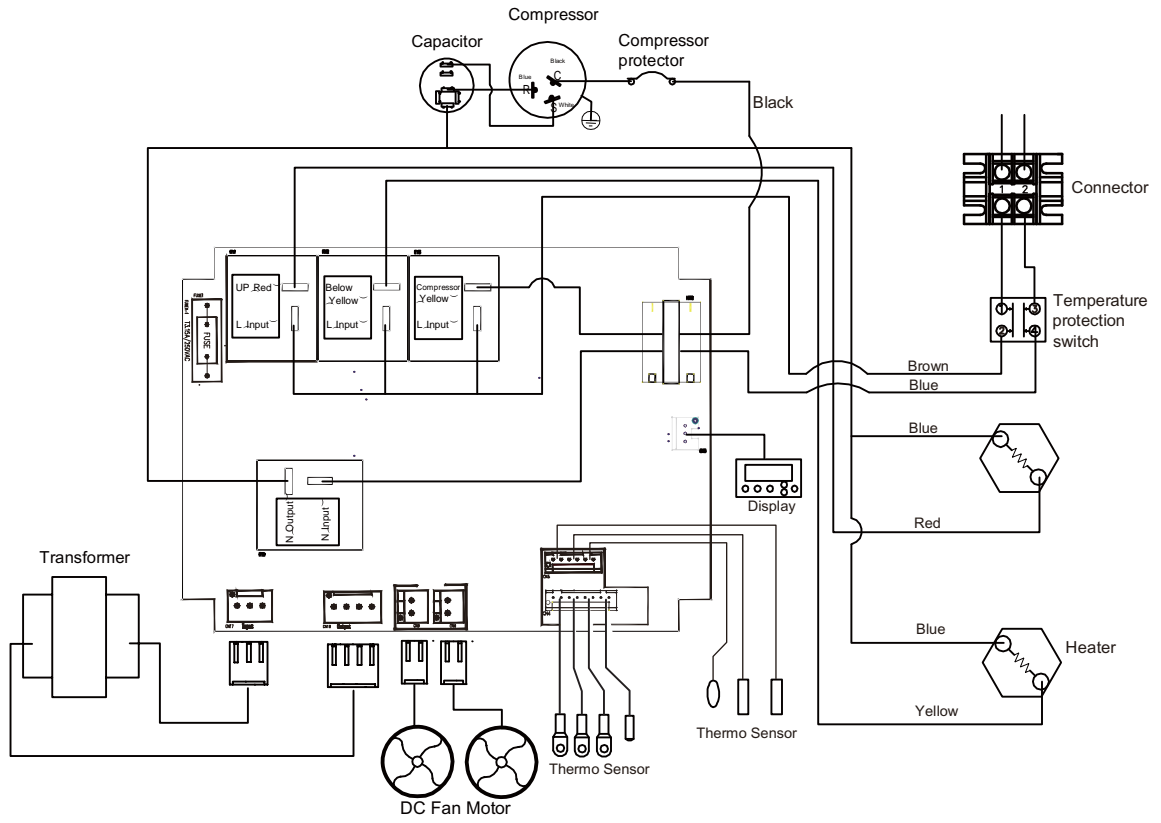


Troubleshooting

Problem	Potential Cause	Corrective Action
No Display No Hot Water	Water heater power off No power available in electric socket Failure in control circuit or internal wiring	Power on water heater Check electric socket Contact local authorized dealer
No Display Overtemperature Water	High temp limit switch open Power board failure	Contact local authorized dealer
Display No Hot Water	Heating element or internal wiring failure	Contact local authorized dealer
Leakage in Tube Joint	Unsealed tube joint.	Reinstall pipe using thread seal tape or ring
Leakage in Jacket	Tank or accessories leakage Water collector blocked Condensation pipe distorted or not downward	Cut off power. Check if condensation pipe is distorted or not downward Contact local authorized dealer
Display "E1"	Black wiring with two-core terminal short circuit or open circuit	Contact local authorized dealer
Display "E2"	White wiring with two-core terminal short circuit or open circuit	Contact local authorized dealer
Display "E6"	Red wiring with two-core terminal short circuit or open circuit	Contact local authorized dealer
Display "E7"	Blue wiring with two-core terminal short circuit or open circuit	Contact local authorized dealer
Display "H6"	Green wiring with six-core terminal short circuit or open circuit	Contact local authorized dealer
Display "H7"	Blue wiring with six-core terminal short circuit or open circuit	Contact local authorized dealer
Display "H8"	Yellow wiring with six-core terminal short circuit or open circuit	Contact local authorized dealer
Display "EA/EB/ED/EE"	Heating element failure	Contact local authorized dealer
Display "EO"	PCB failure	Contact local authorized dealer
Abnormal Noise	Interfere among internal components Compressor not installed horizontally	Contact local authorized dealer
"Reset" button popup, with indicator light up in orange, unable to restore.	Fault in grounding system including both internal and external area of the heater	Cut off power immediately and contact local authorized dealer
Sound at Runtime	Normal sounds of water heater in mode of efficiency include: Sound of fan and compressor running; Sound of refrigerant flowing; Sound of relay acting.	

Wiring Diagram

Fig.21 Wiring Diagram



Warning

- Before installation, check and confirm if water heater power, electricity meter and wiring match up with each other.
- The heat pump water heater should be grounded reliably. It is prohibited to connect the earth wire to neutral wire or tap water pipe.
- Water of 50 °C or above may have risk of scald. Please check water temp by hand and use water mixing valve to get water in appropriate temperature
- Be cautious about the hot water discharge through safety valve, as it may have risk to cause scald.
- For any damage of power cord, please contact local authorized dealer for replacement.

Part List

Serial number	Name	Quantity
1	Heat Pump Water Heater	1
2	User Guide	1
3	Safety Valve	1
4	Hanging Panel Accessories	1
5	Three-pass Discharge Pipe	1
6	Discharge Pipe	1
7	Remote Controller	1



A.O.SMITH WATER HEATER CO., LTD

A.O. Smith reserves the right to make product changes or improvements at any time without notice.

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